UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/753,498	12/27/2000	John N. Hait	2807.2.14.6 .	2165

31555 7590 03/05/2004

GARY L. EASTMAN
EASTMAN & ASSOCIATES
707 BROADWAY STREET, SUITE 1800
SAN DIEGO, CA 92101

EXAMINER	
LEUNG, CHRISTINA Y	

ART UNIT	PAPER NUMBER
2633	7

DATE MAILED: 03/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/753,498	HAIT, JOHN N.	
	Examiner	Art Unit	
	Christina Y. Leung	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 December 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,9-34 and 37-56* is/are rejected.

7)☒ Claim(s) *7,8,35 and 36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 December 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 49 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 49 recites the limitation "wherein selecting further comprises...." in line 1 of the claim. There is insufficient antecedent basis for this limitation in the claim, since claim 46 on which it depends does not explicitly recite a step of "selecting."

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 9-11, 13-15, 29, 37-39, and 41-43 are rejected under 35 U.S.C. 102(b) as being anticipated by Auffret et al. (US 5,424,692 A).

Regarding claim 1, Auffret et al. disclose an apparatus for generating short-duration pulses (Figures 1-3), the apparatus comprising:

an input line (the input Si shown in Figure 1 or 3) configured to receive an input signal having a first arbitrary frequency;

an output line configured to send a photonic signal (output Se) to a photonic destination device (including timing recovery circuit 19 in Figure 3) operating at a second arbitrary frequency different from the first arbitrary frequency; and

a self-synchronizing interface (shaping circuit 1, including elements such as interferometer 3 in Figure 1 and further elements shown in detail in Figure 2) operable to synchronize transfer of information received from the input line, at the first arbitrary frequency, to the output line, at the second arbitrary frequency.

Auffret et al. disclose that the system transfers the input signal having a first frequency (such as shown in Figure 4, part A) into a photonic signal having a second frequency (such as shown in Figure 4, part E; column 3, lines 13-26; column 5, lines 18-68; column 6, lines 1-14).

Regarding claim 29, as similarly discussed above with regard to claim 1, Auffret et al. disclose a method for generating short-duration pulses (Figures 1-3), the method comprising:

providing an input signal having a first arbitrary frequency (the input Si shown in Figure 1 or 3);

self-synchronizing the input signal with a photonic output signal having a second arbitrary frequency (using shaping circuit 1, including elements such as interferometer 3 in Figure 1 and further elements shown in detail in Figure 2, to produce output Se); and

providing the photonic output signal to a photonic destination device (including timing recovery circuit 19 in Figure 3) operating at the second arbitrary frequency different from the first arbitrary frequency.

Regarding claims 9 and 37, Auffret et al. disclose that the input signal is a photonic input signal.

Regarding claims 10 and 38, Auffret et al. disclose that the input signal is an input pulse (Figure 4, part A).

Regarding claims 11 and 39, Auffret et al. disclose that the self-synchronizing interface further comprises a pulse generator operating fully photonically (interferometer 3, for example, produces pulses such as shown in Figure 4, part C, and operates photnically).

Regarding claims 13 and 41, Auffret et al. disclose a fully-photonic, pulse generator configured to provide timing pulses as a time base of the self-synchronizing interface (the further elements shown in Figures 2 and 3 are fully photonic and may generate timing pulses such as shown in Figure 4, part G; column 6, lines 15-48).

Regarding claims 14 and 42, Auffret et al. disclose that the self-synchronizing interface further comprises a sampling module (tunable optical filter 7) for sampling the input signal in order to transfer information therefrom into the output signal (column 4, lines 32-37).

Regarding claims 15 and 43, Auffret et al. disclose that the second arbitrary frequency corresponds to a bit rate (Figure 4, part G; column 6, lines 1-14).

5. Claims 29-34, 37-40, and 43-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Wissman et al. (US 4,932,775 A).

Regarding claim 29, Wissman et al. disclose a method for generating short-duration pulses (Figure 3), the method comprising:

providing an input signal having a first arbitrary frequency (such as the input to laser 80 from RF power source 86 and modulation driver 88);

self-synchronizing the input signal with a photonic output signal having a second arbitrary frequency (the signal output from transmit optics 98 is photonic/optical and has a second frequency; column 5, lines 59-68; column 6, lines 1-12); and

providing the photonic output signal to a photonic destination device (receiver 104) operating at the second arbitrary frequency different from the first arbitrary frequency (column 6, lines 4-12).

Regarding claim 30, Wissman et al. disclose that the self-synchronizing is executed at an operation frequency limited by the order of magnitude of a wavelength corresponding to the photonic output signal (column 5, lines 28-68; column 6, lines 1-8).

Regarding claims 31 and 37, Wissman et al. disclose that the input signal may be an electronic input signal (i.e., the signal from RF power source 86).

Regarding claims 32 and 38, Wissman et al. disclose that the input signal is an input pulse.

Regarding claims 33 and 39, Wissman et al. disclose that the self-synchronizing further comprises generating a photonic pulse (i.e., the photonic/optical signal output from transmit optics 98).

Regarding claims 34 and 40, Wissman et al. disclose that the generating further comprises repetitively forming sequences of photonic pulses derived from a beat frequency corresponding to an interaction of two photonic, source frequencies (column 5, lines 28-68; column 6, lines 1-8). Wissman et al. disclose that the lasers 80 and 90 provide two photonic source frequencies that interact and create an output beat frequency.

Regarding claim 43, Wissman et al. disclose that at least one of the first and second arbitrary frequencies corresponds to a bit rate. Wissman et al. disclose that the second arbitrary frequency (i.e., the beat frequency) may be modulated with information (column 6, lines 37-48), and it would be well understood in the art that the transmitted data on the signal having the second frequency would necessarily have some bit rate.

Regarding claims 44 and 45, Wissman et al. disclose that the first frequency (i.e., the frequency of RF power source 86) corresponds to an analog carrier frequency.

6. Claims 46-56 are rejected under 35 U.S.C. 102(b) as being anticipated by Hait (US 5,644,123 A).

Regarding claim 46, Hait discloses a method for generating short-duration pulses (Figures 23A-C), the method comprising:

generating a first beam (for example, beam 73), characterized by a first frequency;

generating a second beam (for example, beam 74), characterized by a second frequency having a value proximate the value of the first frequency but distinguishably different therefrom (column 53, lines 56-57);

spatially spreading the first beam;

spatially spreading the second beam to superimpose on the first beam at a location in space (location 3), forming an interference pattern thereat; and

directing, to a target position (receiving output beams 77-80, for example), a selected portion of the interference pattern (column 12, lines 33-56; column 53, lines 52-67; column 54, lines 1-22).

Regarding claim 47, Hait discloses masking the interference pattern to select the selected portion (column 6, lines 8-21; column 36, lines 1-10).

Regarding claim 48, Hait discloses selecting the selected portion by defining a target size (column 36, lines 1-23). In other words, Hait discloses that the output target elements have a predefined size (such as the size of a target hole) for selecting the selected portion.

Regarding claim 49, as well as the claim may be understood with regard to 35 U.S.C. 112 discussed above, Hait discloses that selecting further comprises selecting an optical fiber to receive the selected portion of the interference pattern (column 6, lines 13-21; column 36, lines 1-10).

Regarding claim 50, Hait discloses that the optical fiber has a diameter selected to limit the portion of the interference pattern receivable therethrough (column 6, lines 13-21; column 36, lines 1-23).

Regarding claim 51, Hait discloses sending the output signal to a plurality of output targets (Figure 23C, for example, shows a plurality of beams 77-80 output toward a plurality of targets).

Regarding claim 52, Hait discloses that each output target corresponds permanently to a position in the interference pattern (column 36, lines 1-4).

Regarding claim 53, Hait discloses that each output target represents a channel for receiving a fully-photonic signal (output beams 77-80, for example, represent different channels of a multiplexed photonic signal).

Regarding claim 54, Hait discloses that each output target may receives, sequentially, a fully-photonic pulse. Hait discloses an time-division demultiplexing embodiment wherein the targets receive the output pulses sequentially (column 54, lines 3-22).

Regarding claim 55, Hait discloses that the pulse corresponds to a portion of the interference pattern selected from destructive interference and constructive interference. Hait discloses, for example, that the output pulses may correspond to constructive interference (column 36, lines 1-4).

Regarding claim 56, Hait discloses that the output target comprises an optical fiber (column 6, lines 17-18).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-6, 9-12, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wissman et al.

Regarding claim 1, Wissman et al. disclose an apparatus for generating short-duration pulses (Figure 3), the apparatus comprising:

an input line (such as the input to laser 80 from RF power source 86 and modulation driver 88) configured to receive an input signal having a first arbitrary frequency;

an output line (such as the output from transmit optics 98) configured to send a photonic signal to a photonic destination device (such as receiver 104) operating at a second arbitrary frequency different from the first arbitrary frequency; and

a self-synchronizing interface (including the transmit optics 98) operable to synchronize transfer of information received from the input line, at the first arbitrary frequency, to the output line, at the second arbitrary frequency.

Wissman et al. do not specifically disclose an output line since they particularly disclose transmitting the photonic signal through free space to the destination device. However, optical fiber transmission is also well known in the art as a way to transmit optical signals to a receiver such as in the system disclosed by Wissman et al. It would have been obvious to a person of ordinary skill in the art to specifically output the signal from the transmit optics 98 through a line or fiber simply in order to properly transmit the signal over a long distance and so that the receiving elements would not need to be located in a direct line of sight from the transmitter.

Regarding claim 2, Wissman et al. disclose that the self-synchronizing is executed at an operation frequency limited by the order of magnitude of a wavelength corresponding to the photonic output signal (column 5, lines 28-68; column 6, lines 1-8).

Regarding claims 3 and 9, Wissman et al. disclose that the input signal may be an electronic input signal (i.e., the signal from RF power source 86).

Regarding claims 4 and 10, Wissman et al. disclose that the input signal is an input pulse.

Regarding claims 5 and 11, Wissman et al. disclose that the self-synchronizing further comprises generating a photonic pulse (i.e., the photonic/optical signal output from transmit optics 98).

Regarding claims 6 and 12, Wissman et al. disclose that the generating further comprises repetitively forming sequences of photonic pulses derived from a beat frequency corresponding to an interaction of two photonic, source frequencies (column 5, lines 28-68; column 6, lines 1-8). Wissman et al. disclose that the lasers 80 and 90 provide two photonic source frequencies that interact and create an output beat frequency.

Regarding claim 15, Wissman et al. disclose that at least one of the first and second arbitrary frequencies corresponds to a bit rate. Wissman et al. disclose that the second arbitrary frequency (i.e., the beat frequency) may be modulated with information (column 6, lines 37-48), and it would be well understood in the art that the transmitted data on the signal having the second frequency would necessarily have some bit rate.

Regarding claims 16 and 17, Wissman et al. disclose that the first frequency (i.e., the frequency of RF power source 86) corresponds to an analog carrier frequency.

9. Claims 18-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hait in view of Parkin (US 3,597,755 A).

Regarding claim 18, as similarly discussed above with regard to claim 46, Hait discloses a system (Figures 23A-C) including:

a first beam, characterized by a first frequency;

a second beam, characterized by a second frequency having a value proximate the value of the first frequency but distinguishably different therefrom (column 53, lines 56-57);

wherein the beams are spread such that the second beam is superimposed on the first beam at a location in space (location 3), forming an interference pattern thereat; and

an output target (receiving output beams 77-80, for example) positioned proximate the location in space for receiving a selected portion of the interference pattern (column 12, lines 33-56; column 53, lines 52-67; column 54, lines 1-22).

Hait further discloses that the beams may be optical and generated by lasers (although lasers are not explicitly shown in Figures 23A-C, see column 44, lines 9-11) but do not further disclose first and second lenses. However, various components are well known in the art for steering light beams such as from a laser source to a desired location including lenses such as taught in particular by Parkin (Figure 3A shows lens 28 in front of laser 35, for example).

It would have been obvious to a person of ordinary skill in the art to use lenses such as taught by Parkin with the first and second lasers disclosed by Hait in order to further direct the beams toward the desired destination. Examiner further respectfully notes that Applicants' own specification on page 76 suggests that lenses 338 (Figure 45) are "optional."

Regarding claim 19, Hait discloses a mask positioned to select the selected portion of the interference pattern (column 6, lines 8-21; column 36, lines 1-10)..

Regarding claim 20, Hait discloses that the output target is sized to select the selected portion of the interference pattern (column 36, lines 1-23).

Regarding claim 21, Hait discloses that the output target comprises an optical fiber (column 6, lines 17-18).

Regarding claim 22, Hait discloses that the optical fiber has a diameter selected to limit the portion of the interference pattern receivable therethrough (column 6, lines 13-21; column 36, lines 1-23).

Regarding claim 23, Hait discloses a plurality of output targets (Figure 23C, for example, shows a plurality of beams 77-80 output toward a plurality of targets).

Regarding claim 24, Hait discloses that each output target corresponds permanently to a position in the interference pattern (column 36, lines 1-4).

Regarding claim 25, Hait discloses that each output target represents a channel for receiving a fully-photonic signal (output beams 77-80, for example, represent different channels of a multiplexed photonic signal).

Regarding claim 26, Hait discloses that each output target receives, sequentially, a fully-photonic pulse. Hait discloses an time-division demultiplexing embodiment wherein the targets receive the output pulses sequentially (column 54, lines 3-22).

Regarding claim 27, Hait discloses that the pulse corresponds to a portion of the interference pattern selected from destructive interference and constructive interference Hait discloses, for example, that the output pulses may correspond to constructive interference (column 36, lines 1-4).

Regarding claim 28, Hait discloses that the output target comprises an optical fiber (column 6, lines 17-18).

10. Claims 18, 28, 46, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wissman et al. in view of Parkin.

Regarding claim 18, Wissman et al. disclose an apparatus for generating short-duration pulses (Figure 3), the apparatus comprising:

a first laser 80 configured to generate a first beam, characterized by a first frequency;

a second laser 90 configured to generate a second beam, characterized by a second frequency having a value proximate the value of the first frequency but distinguishably different therefrom (column 5, lines 49-52);

optical elements (including reflectors 84 and 94, and transmit optics 98) that superimpose the second beam on the first beam at a location in space, forming an interference pattern thereat (column 5, lines 59-68; column 6, lines 1-8); and

an output target (receiver 104, including receiver optics 106) positioned proximate the location in space for receiving a selected portion of the interference pattern.

Wissman et al. do not specifically disclose first and second lens regions although again. they do disclose superimposing the first and second beams and particularly disclose output reflector 84 and 94. However, various components are well known in the art for steering light beams such as from a laser source to a desired location including reflectors such disclosed by Wissman et al. and lenses such as taught in particular by Parkin (Figure 3A shows lens 28 in front of laser 35, for example).

It would have been obvious to a person of ordinary skill in the art to use lenses such as taught by Parkin with the first and second lasers disclosed by Wissman et al. simply as an engineering design choice of an alternative way to properly direct the beams toward the desired destination. The claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art. Examiner further respectfully notes that Applicants' own specification on page 76 suggests that lenses 338 (Figure 45) are "optional" or may comprise "other equivalent optical elements."

Regarding claim 46, as similarly discussed above with regard to claim 18, Wissman et al. disclose a method for generating short-duration pulses (Figure 3), the method comprising:

generating a first beam (with laser 80), characterized by a first frequency;

generating a second beam (with laser 90), characterized by a second frequency having a value proximate the value of the first frequency but distinguishably different therefrom (column 5, lines 49-52);

superimposing the second beam on the first beam at a location in space, forming an interference pattern thereat (column 5, lines 59-68; column 6, lines 1-8); and

directing, to a target position (receiver 104), a selected portion of the interference pattern.

Wissman et al. do not explicitly disclose spatially spreading the beam, but they do disclose reflectors 84 and 94 for directing the beams to create the interference pattern. However, again, various components are well known in the art for steering light beams including reflectors such disclosed by Wissman et al. and lenses such as taught in particular by Parkin (Figure 3A shows lens 28 in front of laser 35, for example) that would spatially spread the beams toward a desired location.

It would have been obvious to a person of ordinary skill in the art to spatially spread the beams using lenses such as taught by Parkin in the method disclosed by Wissman et al. simply as an engineering design choice of an alternative way to properly direct the beams toward the desired destination. The claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art. Examiner further respectfully notes that Applicants'

own specification on page 76 suggests that lenses 338 (Figure 45) are "optional" or may comprise "other equivalent optical elements."

Regarding claims 28 and 56, Wissman et al. do not specifically disclose that the output target comprises an optical fiber. However, optical fiber transmission is also well known in the art as a way to transmit optical signals to a receiver such as in the system disclosed by Wissman et al. It would have been obvious to a person of ordinary skill in the art to specifically output the signal from the transmit optics 98 in the system or method described by Wissman et al. in view of Parkin through a line or fiber simply in order to properly transmit the signal over a long distance and so that the receiving elements would not need to be located in a direct line of sight from the transmitter.

Allowable Subject Matter

11. Claims 7, 8, 35, and 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter:

The prior art, including Hait, Wissman et al., and Auffret et al., does not disclose or fairly suggest a system or method including the combination of all the limitations recited by claims 7 or 35, and all the limitations of their respective parent claims. In particular, the prior art does not disclose or fairly suggest a system or method as recited by claims 7 or 35 wherein the self-synchronizing is executed at an operation frequency limited by the order of magnitude of a wavelength corresponding to the photonic output signal and further comprises generating

sequences of photonic pulses derived from a beat frequency corresponding to an interaction of two, photonic, source frequencies as well as comprising generating timing pulses.

Examiner notes that Hait, Wissman et al., and Auffret et al. do disclose or suggest various elements and steps in combination as discussed above with regard to the claims rejected above under 35 U.S.C. 102 or 103, but none of them disclose or suggest the specific combination of the multiple limitations and elements recited in claims 7, 8, 35, and 36.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 703-605-1186. The examiner can normally be reached on Monday to Friday, 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4700.

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600